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ABSTRACT

Presented are English summaries of reports and publications originally published in Danish. The summaries are presented in chronological order. Topics include research in areas of problem solving, action research in theory and practice, developmental trends in special teaching, evaluation, research planning - a development process, and special education in Denmark. (DS)

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Research Report Summaries 1976-78
The Danish Institute for Educational Research

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RESEARCH REPORT SUMMARIES 1976-78
THE DANISH INSTITUTE
FOR EDUCATIONAL RESEARCH

EDITORS: JESPER FLORANDER, VAGN RABØL HANSEN, FINN RASBORG

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RESEARCH REPORT SUMMARIES 1976-78
THE DANISH INSTITUTE FOR EDUCATIONAL RESEARCH

Preface

The aim of this publication is to give information about reports and publications from the Institute published during 1976-1978.

The information is given in the form of summaries of the original publications which are usually published in Danish. The authors will be pleased to provide further information on specific projects, if required.

This publication is the second containing research summaries. The first was published in 1976 and contains summaries of a representative sample from approximately 470 publications, dating back to about 1955.

The summaries are presented chronologically.

Translation by Vivian Leander and Dorte Vasegaard Hauch.
Editors: Jesper Florander, Vagn Rabøl Hansen, Finn Rasborg.

DPI 1976.16

Problem solving from a pedagogical point of view

Ole Bredo

This paper attempts to consider problem solving from a pedagogical point of view. The purpose of doing this is an attempt to characterize the cognitive processes involved in problem solving in a way relevant to learning theory.

It is postulated that the experimenter's interaction with the problem situation will promote a differentiated characteristic of the problem solving behaviour, and it is the point of this paper that in setting out the conditions that will make an interaction possible, the experimenter will promote an analysis of the problem-solving process relevant to learning theory.

In the first part of the paper (ch. 1-2) description requirements are stated and exemplified - requirements that in my opinion have to be maintained with regard to recording of the problem solving process seen from a pedagogical point of view.

In the second part (ch. 3-5) the qualifications of the requirements stated have been elaborated to make a pedagogically interacting experimenter-behaviour possible. In particular it is demonstrated that a description of the solving behaviour presupposing the solving process "as a gestalt", i.e. existing in full, will <u>not</u> result in a differentiated characteristic of the solving process.

DPI 1976.19

A probabilistic measurement model for assessing whether two tests measure the same personal factor

Gustav Leunbach

This study develops a method for estimating the parameters of the discrete (non-negative integer) probability distribution (5), the "power series distribution".

The observational situation which permits the method to be applied, is one where each of a series of trials contains observations from two power series distributions with the same value of the "independent variable".

In the real-life situation which has inspired this formalized scheme, each trial pertains to a person who is given two proficiency tests within some area. The γ-parameters of (5) are characteristics of the proficiency test; the "independent variable" ξ is a characteristic of the person, his ability to solve a test. That ξ is the same in the two observations means that his ability is the same for solving both tests; this is the operational content of the statement that the tests cover the same area.

The two sets of γ-parameters determine a modal relationship between scores in the two tests by means of the expected value of each score, conditional on a given sum of both scores. Also, the variances of these conditional distributions are computed from given (estimated) γ-values. An important feature of the model is that the conditional distribution does not depend on the value of ξ; that is, test scores from persons of varying ability may be used in the analysis without the necessity of assuming e.g. unimodality of the distribution of abilities.

These conditional distributions make possible various controls of the model. If the assumption of a common ξ for the two observations of a trial does not hold, an alternative model with varying ratios between ξ's for different trials will result in composite conditional distributions with greater dispersal than the pure distribution above.

The model is controlled against this type of alternative in two ways: Graphically by plotting either mean or standard deviation of one observation for trials with a given sum against this sum, and comparing with a plot of expected value or variance.

And by a significance test which compares the number of observed values of one score beyond a certain distance from the modal value with the expected number of such outlying values by way of the variance of this expectation.

The model has been applied to several tests of general arithmetic given two by two to school children in the 5th school year. The above-mentioned statistical tests have not refuted the model.

The estimated γ-values have, moreover, in all cases shown good fit to a structure which is describable by two parameters; the relationship between score value and the logarithm of the corresponding γ is in this structure a second degree polynomium.

The parameters of this model can also be estimated without prior knowledge of the distribution of ξ's in a situation where two results are given in each trial. And the model is tested by a χ^2-test derived by the likelihood ratio method.

These tests reject the simplified model as a parametric model for the proficiency test results studied; it must be considered a numerical approximation. As such, it gives a simple expression for the variance of a test score at a level of ability where the probability of a score near zero is very low.

This analysis demonstrates one possible way of simplifying the general model. In other cases other parametrizations may be more appropriate.

Through significance testing of the general model, an answer is given to the question of the title: if observations vary too much, according to the conditional distributions mentioned above, the hypothesis that the same ability parameter of each person determines his result in the two tests is refuted.

If observations vary too little, the assumption of stochastic independence between test results may be wrong. Such results do not depend on any assumptions concerning the ability levels of the persons tested.

DPI 1976.22

Arithmetic/mathematics in the Folkeskole (public primary and lower secondary school). Vol. I. - Opinions on a subject in process of change

Peter Allerup, Ole Bredo, Vagn Rabøl Hansen, Mogens Jansen, Jesper Jensen, Agnes Kartholm, Gustav Leunbach, Peer Mylov, Svend Kreiner Møller, Thomas Nissen, Sten C. Poulsen, Børge Prien, Finn Rasborg, Sven Thyssen.

1. Why teach mathematics in the Folkeskole? (by Sten C. Poulsen and Svend Kreiner Møller)

The teaching of mathematics in the first classes of the Folkeskole has been introduced partly for short-term and partly for long-term reasons.

The short-term arguments are e.g. 1) that mathematics is best understood with the help of concepts from the theory of sets, 2) that symbolic mathematics in particular has aesthetic value, 3) that real mathematical understanding facilitates the learning of number calculation, 4) and that mathematics can be used in the school within the other subjects.

Long-term arguments are e.g. 1) that mathematics takes a long time to learn and must be begun early in order to form the basis of vocational training later, 2) that mathematical models have general possibilities of applications.

These arguments are evaluated critically, and a suggestion for the basic structure of mathematics teaching in the Folkeskole is outlined.

2. The relationship between scientific theory, development psychology and mathematical understanding (by Thomas Nissen)

The paper, which is an introduction to a discussion, deals with the concepts 'abstract' and 'formal' in the development psychological context. Attention is drawn to some general misunderstandings which can result in the pedagogical work of giving children the background for mathematical understanding becoming unsystematic or influenced by an attitude of expectation. Further, a relationship between understanding of the scientific process and the subject-didactic possibilities of mathematics to give teaching a practical content is pointed out.

3. On the realism of mathematics (by Jesper Jensen)

The paper contains some pedagogical considerations on the subject arithmetic/mathematic's basis in reality. Where does the subject take its topics from? How can we pose the problem of realism? Can arithmetic/mathematics be used in an interdisciplinary context? Which guiding principles can be used to ease the topic-pressure?

4. Background and organisation of the teaching (by Sven Thyssen)

It is discussed what understanding about children's background that is expressed in the curriculum guidelines, and which suggestions for teaching methods are put forward in this connection. It appears that the concept of background in the curriculum guidelines is not clear, and that the real problems implied in the background concept are glossed over rather than clarified.

It is pointed out that the question of children's background cannot be considered solely a question of difference in quantity, as the theory of intelligence indicates, but is

also a question of difference in quality. For example, the solving of mathematical problems requires a number of qualitative prerequisites, of which many can be developed outside the area of mathematics as such, for example within other subject areas and in the area of social development.

The organisation of teaching is therefore a question of creating a learning environment which corresponds to the qualitative differences in background that characterizes each individual pupil in relation to the others. In this connection one must consider the nature of the internal co-operation in the class in relation to the existing tasks. For example, if group work is to be carried out, what kind of background should each individual group member have in order for all members of the group to develop as far as possible? The answer to this and similar questions must take place via pedagogic-psychological research.

5. The development of mathematical concepts (by Vagn Rabøl Hansen and Ole Bredo

In general, it must be required of a conceptual development within mathematics, that the pupils are given the possibility of extending beyond the actual learning situation of the concrete working of examples and thus are not fixed in a particular learning phase or bound to a particular material. The question which therefore arises first when conceptual development in a particular subject is discussed, is what is required in the planning of teaching and especially the drafting and presentation of the teaching material, in order that such conceptual extension can take place.

6. Childrens' concepts of learning mathematics (by Sten C. Poulsén

In the subject mathematics in particular, we know very little of the childrens' private learning activities - such as homework and individual problem-solving in school. In maths lessons the children learn mathematics, but they also learn - often indirectly - something about how to organize their private learning process. There is a real research project here.

7. On the development of mathematical understanding (by Vagn Rabøl Hansen and Sven Thyssen)

This contribution is based on a conversation with professor D.B. Elkonin from the Institute of Child Psychology at Moscow University. Elkonin has studied the development of abstract thought in children for many years, and his research has been of great importance in the teaching of mathematics in the nursery school and in school. The conversation took place in October 1975 and the essence of it is that difficulty with the new mathematics is more a question of pedagogics than of content.

8. A suggestion for the examination of what it is that is so difficult in mathematics (by Børge Prien and Agnes Kartholm)

The suggestion consists in clarifying the pupils' difficulties in mathematics from empirical material consisting of the pupils' answers to mathematical problems. The study should cover the number and kind of mistakes (partly in problems built into various textbook systems and partly in those from kits composed of the systematic combination of particular arithmetical procedures) and should be carried out by means of analytical methods based on Rasch's probability model for problem-solving, and aim directly at the determination of the difficulty of the individual procedure.

A study of degree of difficulty in analogue problems from different textbook systems will possibly also show what difficulties are connected with a particular terminology.

9. On the building-up of a test system for a varied illustration of the effect of various types of maths teaching (by Gustav Leunbach)

The article suggests an alternative to the paper and pencil tests: problems that are too difficult for the pupils to solve by themselves and which should be solved in the form of a dialogue. Instead of a dialogue between the teacher and each individual pupil it is suggested to use a less resource-demanding form where the teacher's remarks in the dialogue are given in the form of a computer programme. This means a

limitation of the content and form of the topics which can be presented, but not a limitation as narrow as may be feared by many people. It is discussed which relation such a test programme has to the concept of learning.

10. Planning of teaching - in arithmetic/mathematics (by Finn Rasborg)

The subject arithmetic/mathematics will be changed considerably when the Folkeskole Act of 1975 comes into force in August 1976. Changes often lead to disturbance, - but disturbance can be transposed into something fruitful and into furthering development, if the energy can be controlled and used in working towards professional improvement in interaction with a comprehensive pedagogical view, which again can lead to a purposeful balance between confidence and uncertainty towards what is new.

One teacher-attitude is that the essential and sufficient basis for teaching arithmetic/mathematics is an arithmetic/mathematics book, possibly with supplementary material and a short instruction book - and common sense.

The other attitude is that teaching materials are necessary, but far from sufficient for the understanding, planning and carrying out of the teaching. According to this point of view it will be necessary to be well-orientated on teaching materials in the subject, to have a wide and comprehensive knowledge of the problems involved in the subject, and to have a pedagogical insight into the most important pedagogical functions which can be used in planning and implementing the teaching. The pedagogical functions can be listed according to several different principles, and there are many of them, but here it is sufficient to mention a few:

To plan:

1. Chart general aims and particular aims of subjects.
2. Chart pre-conditions.
3. Planning of teaching.

4. Planning of evaluation.
5. Project and plan possibilities for improvement.

To carry out or realize:

1. Make use of the charted general aims and subject objectives.
2. Make use of the charted pre-conditions.
3. Use the teaching plan.
4. Use the planned evaluation.
5. Use the projected possibilities for improvement.

The thorough preparation of planning and foresight makes it easier for the teacher to carry out the difficult task: of directing the abundant vitality of the pupils in ways which promote development.

11. Forms or organisation in arithmetic/mathematics (by Finn Rasborg)

Three kinds of organisation are distinguished: Class work, work in small groups and individual work.

These various kinds of organisation each form their own social environment. Ordinary class work offers only little inspiration, but this can be supplemented with advantage by the inspirational environments that can be created in the other two kinds of organisation. The way in which the kinds of organisation can be used to extend the experience of the pupils in problem-solving by allowing the same problem to be solved through a combination of the various kinds of organisation is described: 1) class work, 2) individual work, 3) work in small groups, 4) individual work, 5) class work.

12. Teaching practice in mathematics - an educational development project (by Finn Rasborg)

If the new subject arithmetic/mathematics in the new Folkeskole Act is to be a success, it is necessary to establish a well-structured teaching practice with a clear content in the subject for the student-teachers in the country's 29 training

colleges, and an equally well-founded practice for teachers on refresher and further training courses. Such a practice could result in ensuring a positive development during the bridging phase from the old subject arithmetic to the new arithmetic/mathematics, and to bringing the teaching in the following consolidation phase into a developmentally positive and undisturbed continuity.

A suitable teaching practice can be established by for example drafting and using a description of what teaching competence teachers in arithmetic/mathematics should acquire during the practice. A realistic basis for such a competence-description is the daily experience of difficulties in arithmetic/mathematics and subject didactics, general didactics, and experience with pedagogical models in practice.

A competence-description is described, worked out for the use of mathematics teachers in the 'Gymnasium' (upper secondary school).

The connection between the stages of training is emphasized: Improved practice in the college training will lead to better teachers in arithmetic/mathematics in the Folkeskole (public primary and lower secondary school) which will again necessitate a change in the teaching of arithmetic/mathematics in the 'Gymnasium'.

13. Phases in teaching practice (by Finn Rasborg)

In some cases critic teachers and student-teachers put a great effort into teaching practice in arithmetic/mathematics. But in a number of cases there is a reduction of effort which gives insufficient return: 1) Students can avoid important parts of the practice, 2) critic teachers can avoid some of their duties as critic teachers, or 3) both critic teachers and student-teachers can avoid the practice project by tacit agreement.

If the colleges made clear requirements to the critic teachers and student-teachers it would be difficult to get away with. Among the requirements should be: 1) preparation of a long-term plan for the practice period, 2) thorough observation and analysis of the progress of lessons during the whole period, 3) discussion between teacher and student immediately after the lesson, 4) the student-teachers' independent analysis of the lesson, possibly based on tapes, planning of continuation with reasons stated in writing, 5) practice meetings on analyses and planning, 6) conferences between teachers and students.

14. The course of teaching in arithmetic/mathematics (by Peer Mylov)

The subject arithmetic/mathematics in the Folkeskole has experienced a strong development in the last 10-15 years in Denmark. The scientific mathematics and development psychology has in an international context presented a new basis, which now influences textbook systems and teaching from the first year in school. But this reform from 'above' via textbooks and courses breaks with traditional experience and expectations of teachers, pupils, parents and others in the concrete teaching situation. The teacher is often faced with problems of motivating and communicating untraditional material for a subject which is so strongly emphasized in school. In this contribution concrete examples are given to show the very demanding task that arithmetic/mathematics teachers are in the process of carrying out. These are not representative teaching processes or extracts from textbooks, but concern a particular textbook system used in two classes. The particular aim is to define two levels, namely the planned teaching and the actual course of action. The teacher in arithmetic/mathematics has to bridge the gap between a reformed didactic/methodical level and daily practice.

15. The arithmetic/mathematics teacher's document collection. Teaching guides, curriculum guidelines, and provisions (by Finn Rasborg)

This chapter contains a summary of teaching guides, curriculum guidelines and provisions concerning the subject arithmetic/mathematics in the Folkeskole, i.e. the documents that the arithmetic/mathematics teacher constantly needs for advice on how to interpret the current provisions in the context of the arithmetic/mathematical development in the children in the class.

'The draft', also called 'the teaching guide' is from 1974, and no longer applies.

Arithmetic/mathematics 1976 is the teaching guide in force from 1 August, 1976.

Lesson distribution plans are found in the Ministry of Education Guide of 16 September, 1975.

The aim of teaching in arithmetic/mathematics is found in the Act of 26 June, 1975, on the Folkeskole, and in ministerial order of 24 September, 1975, from the Ministry of Education.

Guidelines for curriculum for the subject arithmetic/mathematics in the Folkeskole.

An alternative suggestion to the curriculum guide has been published by Danmarks Matematiklærerforening (The Danish Association of Mathematics Teachers).

The municipal curriculum.

Ministerial order on requirements for final examinations in the Folkeskole.

Ministerial order on the holding of leaving examinations, marking, leaving certificates, etc. Expected 1 February, 1977.

With this collection of documents in hand the teacher is able to avoid possible one-sided interpretations which could be put on the subject, in teaching materials, teaching guides, in ordinary routines, in instructions - and the teachers in planning and implementing the teaching can base their work on wide interpretations.

DPI 1976.36

The Observation of Teaching

Poul Erik Jensen

This paper gives an outline and evaluation of the use of the observation of teaching in research.

Questions such as the following are discussed: Can teaching be described? What kind of relationship is there between descriptions and explanations? And to which extent can the method be relied upon for objectivity?

Next the classroom research studies are classified in five categories: atheoretical studies, theory-bound observation studies, evaluation procedure, intentions and practice, and clarification of the field of influence.

Finally, the aim of ethnographical classroom studies is described. The aim of these studies is often to explain relationships in individual cases, without regard to whether the same explanation is applicable in other cases! Ethnographical classroom studies are not very widespread, but they have made important contributions to the educational-psychological debate.

DPI 1976.40

Co-operation of upbringing and education

Finn Rasborg

Co-operation and co-ordination amongst research institutions concerned with education in the home and education in schools is a necessity, i.a. since co-operation can lead to a more appropriate use of resources. If co-operation and co-ordination is to succeed it is necessary at a very early stage to exchange information on on-going, planned or desired research and developmental work. The reciprocal information makes it possible for interested institutions, working groups or individuals to contact each other in time and discuss possibilities for co-operation.

By educational research is understood research into theory and practice concerning education - in the widest sense of the word, including a number of areas e.g. educational policy, aims of education, educational philosophy, conditions for education, planning of educational activities, evaluation of education, improvement of education.

Education in this wider sense is needed by the many levels of systems and individuals found in a democratic society:

Questions of education at the parliamentary, ministerial, departmental, administrative, county, local authority, and institution level, at the teacher-group level, at the individual school level, at the classroom level, at the small group pupil level, at 2 person-group level and at the individual level. In addition to this there are a number of levels within 'home' and 'leisure-time'.

Educational research in its widest sense comprises a number of educational disciplines, sociology and psychology, and a number of areas which contain or give information about the administrative steering tools used in steering the educational

sectors, e.g. legislation, ministerial decisions, economy, administrative law, national, county and local authority planning etc. Educational research in its wide sense is thus interdisciplinary.

Educational research in its wide sense covers the course of life: infant-age, nursery-school age, primary and lower secondary school age, adolescence, adulthood and retirement.

Education in its widest sense covers theory and practice concerning the desired results of education. It also covers undesired results that have adversary effects, directly or indirectly, on education.

DPI 1976/41

Pedagogical planning and development of abilities and motivation

Sven Thyssen

This publication deals with the motivational and cognitive characteristics of the individual.

Some principal lines are drawn up in the development of theories concerning abilities and motivation respectively, and it is shown how some basic questions in connection with these characteristics remain unsolved. First and foremost, the whole question of the mode of development of motivational and cognitive characteristics is not treated in a satisfactory way. Therefore, much traditional psychology of motivation and of abilities is of limited value in educational practice, for instance when it appears from theories of motivation that the instruction is to be based on the interests of the child, while the whole question of development of interests and of the function of instruction and education in this process is not taken into consideration.

In the present publication it is explained how the characteristics - motivation and abilities - are developed in a joint process and how this process of development depends on interaction between biological processes in the individual and the material and social conditions under which he grows up. Furthermore, some educational lines for development of appropriate structures of ability and motivation in children are explained.

DPI 1976.42

Exact tests for binomial and polynomial distributions

Svend Kreiner Møller, Gordon Sorber and Anders Raasted

This report contains a description of a series of computer programmes which enable exact tests of contingency tables with two columns, but with more than two rows.

In addition to documentation of the programmes, their execution is fully described, with an explanation of the basic method utilized for the exact test.

It is possible to argue that these tests are, in principle, preferable to the traditional χ^2 and likelihood-ratio tests, but due to the large amounts of time involved in the computations when the number of observations is large, their value is greatest when there are relatively few observations: e.g. in situations where the χ^2 -test cannot be used because the expected number of observations in a cell is too small (less than 3 to 5).

DPI 1976.43

Arithmetic/mathematics in the Folkeskole (public primary and lower secondary school). Vol. II. - Analysis of Teaching Materials

Peter Allerup, Ole Bredo, Vagn Rabøl Hansen, Mogens Jansen, Jesper Jensen, Agnes Kartholm, Gustav Leunbach, Peer Mylov, Svend Kreiner Møller, Thomas Nissen, Sten C. Poulsen, Børge Prien, Finn Rasborg and Sven Thyssen.

The analyses are especially aimed at characteristic features mainly of the problems contained in the books.

1. On the presentation of material in textbooks, especially textbooks of mathematics and work books (by Mogens Jansen)

A study of the individual problems seems to indicate that words that are unusual - or conceptually difficult for the age-level concerned - contribute to making a problem difficult.

Sentence-structure also seems to be of some importance, in that in working through a number of problems it looked as though long or linguistically complicated sentences make it difficult for the pupils to absorb the material.

The system 'Matematik's rather over-organized typography and use of colour, which is not perhaps carried out pedagogically in all its details, together with a lot of 'boxes', frames, etc. probably makes a number of problems more difficult, especially for weaker readers, than the text and number-content of the problems themselves.

Apart from this, however, it seems as though a problem's 'total' appearance and content is important to the pupil's concept of the difficulty of the problem.

Language in textbooks is treated in detail in the next paper.

2. Analyses of the language of some mathematics books and other textbooks (Lix and other linguistic characteristics of Danish Folkeskole texts) (by Børge Prien)

In this article a number of comparative analyses of the language in some mathematics books, Danish books and geography books for forms 3 and 6 are discussed. The point of departure for the linguistic description of the texts is the legibility index (Lix) which particularly aims at evaluating the texts with reference to how difficult they are to read. The study begins with an analysis of published Lix figures and continues with studies of own material.

Lix is the sum of two components, of which one refers to the length of the passages in the text (the average sentence-length) and the other refers to the length of the words in the text (percentage of long words). The numerical value of Lix for mathematics books and for Danish books turns out to be more characteristic of the class level than of the subject.

For Danish books the two Lix components are more or less of the same size. The Lix of the mathematics books on the other hand, is dominated by the percentage of long words. This is not very different from one mathematics system to the other. Compared to the Danish books the mathematics books have a low sentence-length and a high long-word percentage. The geography books studied have just as high a long-word percentage as the mathematics books, but not such a low sentence-length as these.

In the use of Lix for own material, an attempt is made to show how Lix can be used to describe text books. Lix can be shown with good approximation to be a simple function of the expression: Number of long words per sentence.

The sentence-length (average number of words between two full stops in the text) is a product of two factors, namely the length of the phrase or clause and the number of clauses per sentence. Even though the sentence-length is low in the mathematics books examined, their clause-length is not, but the

number of clauses per sentence is low. With reference to the number of clauses per sentence the Danish books show higher figures than both the geography and mathematics books.

Studies of the average length of words in the texts show that the percentage of long words can be described as approximately equal to linear transformation of the average word-length. This has shown itself to be connected with the fact that definition of long words as words with at least seven letters results in the word-group, not-long words, becoming a group with almost constant average word-length in the various texts.

An analysis where extracts from the text-books are divided into word categories, shows how the long-word percentages are composed as the sum of contributions from the individual word categories. For all the texts nouns are those which make the greatest contribution. Verbs, adjectives and numerals can be moderate contributors of long words. Adverbs, pronouns and prepositions must be described as poor contributors of long words, whilst conjunctions, articles and exclamations do not contribute with long words. The contribution of numerals to the percentage of long words in mathematics books is discussed individually.

The contribution of each word category to the long-word percentage of the text consists of the product of 'the word-category's percentage share of the words of the text' and 'the word-category's local long-word percentage in the text'. The difference in the long-word percentage for the books of different subjects is to a great extent due to the nouns. They are both more highly represented and have greater local long-word percentages in geography and mathematics than in Danish books. The increase in percentage of long words from the third to the sixth forms in the texts for each subject depends mostly on an increase in local long-word percentage within a number of word categories which for the mathematics texts only includes nouns.

The division of the extracts according to word categories is next used as a description of language: There are i.a. relatively few verbs and pronouns in geography and mathematics texts, but a large number of nouns and prepositions. The various types of text are illustrated by diagrams of the percentage word-category distribution of the texts and of the word-class distribution per 100 verbs in the texts. Finally, the average clause-length is included in the description, in that the number of words from each word category is calculated per 100 sentences. The graph of these data, the clause profile, shows very clearly the difference between the texts of the various subjects.

Finally, some preliminary considerations are put forward on the connection between length of clause and long-word percentage. The desirability of empirical studies of mistakes in reading, reading time and understanding in relation to proven different text types is stressed. The problems in connection with the pupils' different linguistic background are touched upon, and the readability of the texts is seen in relation to the textbooks' pedagogical aim and the different reading situations that apply to the texts of the various subjects.

3. Analysis of the contents of two mathematics systems (by Peter Allerup and Svend Kreiner Møller)

Two different mathematics systems for use in mathematics teaching in the Folkeskole have been compared with regard to the mathematical content. From the many topics dealt with in the course of the first 6 school years some central areas have been chosen for comparison.

The two systems, Cort and Johannessens: 'Matematik (CJ)' and 'Hej Matematik (HM)' were shown to be very different, both with reference to the concrete topics they deal with and with regard to the more general attitude to mathematics: One system (CJ) was characterized by a high degree of abstraction and formalisation, whilst the other (HM) was concrete to an extent that was reminiscent of the earlier mathematics teaching.

Despite the great differences between the two systems, none of the materials could be said to extend beyond the framework outlined by the teaching guide for mathematics teaching. On the other hand, the study demonstrates i.a. how wide this framework is, and it is only reasonable to debate how far it is desirable to have such a wide freedom of choice in the selection of topics and methods.

DPI 1976.44

Action research in practice. Project oriented teaching at short seminars in Danish folk high schools. A pedagogical research and development project for members of The Danish Trade and Office Workers' Union

Carl Holten-Andersen

The purpose of the pedagogical research and developmental project was to come in contact with individuals who normally do not have the possibility of taking a course at a folk high school, and especially adults who feel that their education is insufficient.

To achieve this co-operation was established with Handels- og Kontorfunktionærernes Forbund in Denmark (The Danish Trade and Office Workers' Union), through short term seminars.

It was also the intention to combine the work at the seminar with the participants' everyday routine.

Inspired by Oskar Negt's experience of the spread of knowledge among workers in Germany, the seminar was based on his "Soziologische Phantasie und Exemplarisches Lernen". Case studies and role play associated with the participants' experience were used to elucidate and criticize some important aspects of their ordinary life, so that these problems were seen in the light of society in general.

In order to enlarge on the connection between the activities at the folk high school and participants' daily work,

the students selected projects, which they could continue to work with when they came home.

Furthermore, follow-up seminars were planned where the participants could exchange experience from their projects and continue the discussions from the first seminar.

The fact that the content of the instruction was relevant to the participants' field of experience led to a very active participation in the seminar. This activity could not be transposed to the same extent to the project work in the periods between seminars, mainly because the projects were too generally formulated and also because geographical distance between the participants hindered the reciprocal support which had existed at the seminar.

The strength of the pedagogical research and developmental project lies in its being an example of the fact that folk high schools and the trade unions can work co-operatively, and that short seminars with projects in the intervening periods can be a realistic offer to groups of people who normally do not have the possibility of coming to a more long-term folk high school course, - assuming that the participants are able to keep in contact with each other and with the high school during the project work periods.

This contact might be continued through the educational associations, the adult educational centres or the like.

The results are brought to the attention of the folk high schools and the trade unions through the publications: ACTION RESEARCH IN PRACTICE and ACTION RESEARCH IN THEORY, in the hope that they will help to give ideas for the initiation of new experiments.

DPI 1976.45

Action research in theory. Some meta-theoretical considerations in relation to a pedagogical research and developmental project for the members of The Danish Trade and Office Workers' Union

Carl Holten-Andersen

The publication deals with some meta-theoretical considerations in relation to a pedagogical research and developmental project for the members of Handels- og Kontorfunktionærernes Forbund in Denmark (The Danish Trade and Office Workers' Union). This activity included short seminars at a folk high school with project work in the intervening periods.

The model for the pedagogical research and development project is discussed. This discussion is concluded in a delimitation of pedagogical action research as the integrated educational and research activity which aims at a connection between theory and action - maintained through systematic planning and evaluation.

The relationship between idealism and materialism and the relationship between theory and practice is discussed. The discussion is based on Poul Bjerre's dynamic philosophy and Mao Tsetung's dialectical materialism.

In the light of these meta-theoretical views, the concrete action research programme is illustrated, both in relation to the seminar students themselves and in relation to the folk high school.

An illustration is included of the internal and external validity of the data material and its analysis; and of the relationship between the evaluation of the individual and of the pedagogical system.

Similarly, the function of the action researcher is discussed. The difficulties are explained which arise when the action researcher does the final theoretical analysis, and when he moves from the practical to the theoretical work and at the same time moves from collective to individual work.

Two tendencies in action research are dealt with: namely a cultural radical-progressive one and a technocratic-functionalistic one. The pedagogical research and developmental project is placed in the area of a technocratic-functionalistic action research to stress that the results cannot be regarded as "revolutionizing".

The strength of the pedagogical research and developmental project is that it shows that folk high schools and the trade unions can work co-operatively, and that short seminars with projects in the intervening periods can be a realistic offer to groups of people who normally do not have the possibility of attending a more long-term folk high school course. -

The results are brought to the attention of the folk high schools and the trade unions through the publications: ACTION RESEARCH IN PRACTICE and ACTION RESEARCH IN THEORY, in the hope that they will help to give ideas for the initiation of new experiments.

DPI 1976.46

Contemporary Choice - Future Life. The Centralization/Decentralization Conflict in the Planning of Community Development, Educational, Sociological, Psychological

Finn Rasborg

The above mentioned publication is a 42 page summary of a doctoral dissertation:

Finn Rasborg: Nutids valg - fremtids vilkår. Centraliserings/decentraliseringskonflikten i planlægning af samfundsudvikling pædagogisk, sociologisk, psykologisk.
Copenhagen: Munksgaard, 1976.

The summary is published by the institute.

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Information about The Danish Institute for Educational Research

DPI 1976.48

Problem solving as a process

Jørgen Aage Jensen and Ole Bredo

This paper discusses some general requirements for an adequate description of cognitive processes. Considering systematic intervention as a necessary part of the observational procedure, a problem-solving situation concerning elementary logic operations is analyzed as a communication system comprising the subject, the task, and the experimenter.

The essential point is that as well as having a clear pragmatic instructional intention the intervention must be seen as having an epistemological intention, i.e. only through acknowledging and elaborating the intervention as an essential part of observation can adequate knowledge about cognitive processes be accumulated. Influence by the experimenter during problem-solving courses is not to be regarded as experimental error, to be corrected by increasingly standardized procedures but is an issue the conditions of which are to be analyzed and investigated.

What we try to argue is that it should be avoided that intervention becomes a treatment above and beyond the experimenter's observation of the subject's behaviour but instead be included as an integral part of the description of this. Perhaps our view is illustrated by contrasting it to the confusedly radical instructional optimism which is displayed in "practical" educational psychology. This view is concerned with the narrowest pragmatic reasons as a basis for changing instructional procedures. The people who endorse it will "try even an unreasonable one (i.e. an instructional procedure) if someone else has already demonstrated that it works", (Hosford, 1973). By contrast we would define pedagogical intervention as a modification of the individual's environment on the basis of a process analysis and a model of learning, and this is what we mean by stressing the dialectic nature of observation.

The concept of intervention requires two sets of specifications: 1) identification and characterization of the process, and 2) interpretation of the course in the light of the model of learning. And this interpretation must be of a character that sets the stage for an intervention, or more generally formulated: the characterization of the subject must be pedagogically guiding.

DPI 1976.51

Development trends in special teaching. Revised 1976/77

Peter Allerup and Poul Erik Jensen

An evaluation of general tendencies in the development of special classes, remedial classes, and in the number of lessons for 'other special teaching' on the basis of statistics from four school years. It is claimed that the extent of special teaching is increasing strongly. Here is documentation of how special teaching has developed, and what the future development can perhaps be estimated to be. The report also includes statistical information on the development of all special teaching in Denmark.

DPI 1976.61

The school is more than subjects - on the functions of the classroom teacher

Lone Gregersen, Mogens Jansen, Mogens Hansen, Anders Leerskov, Flemming Lundahl, Jan Reisinger

A pedagogical research study for which Statens Humanistiske Forskningsråd (The Government Council for Research in the Humanities) provided the economic means, bore the title: 'Study of social, socio-psychological and socio-pedagogical activities' ('Classroom teacher functions in the Folkeskole') (= public primary and lower secondary school). This research project, which was carried out in the course of 1972-1976 has been mentioned in a number of internal reports, in a number of duplicated reports, and in articles in various professional publications.

The book sums up the most important of the reports, articles etc. previously published in a form that is directly applicable to teacher-training and further education for teachers.

The Danish classroom teacher is not the same as a form-master. He or she has complete socio-educational responsibility for the individual pupil's school day and in practice the responsibility often extends beyond this.

A Danish classroom teacher nearly always teaches in Danish and possibly one or more other subjects from form 1 to form 10 (from age 7 to 17). The classroom teacher can choose only to follow the class for a shorter period, e.g. from form 1 to form 5, form 1 to form 7 or even shorter, but in principle it is the same teacher who follows the same pupils.

A classroom teacher in Danish thus follows the same class in the same subjects for several (or many) years, but each year has only the responsibility for a part of the class's

teaching. The class has other teachers for example in mathematics, 'orientation' (subjects such as history, geography, biology), creative art, etc., but these teachers do not necessarily change class each year; there is a tendency that they also follow classes over a period of years, though for a shorter period than the teacher in Danish.

The work of the classroom teacher, socio-educational, administrative, advisory, guiding, and work in connection with the parents, has increased considerably in the last two decades - how much is documented and discussed in the book.

The book gives an account of the guidance and advice, that in practice is very different from advice and guidance given in the school systems of other countries.

An account is given of the school as a social organisation and of a very comprehensive literature study.

One of the sections in the book is devoted to the 'free class discussion' which in all ten school years is one regular lesson per week set aside for the 'class's own use'. This lesson is not used for subject teaching and its content is now very often determined by the pupils.

DPI 1977.1

Project work - experience and practical guidance

Poulsen, S.C., Berthelsen, J. & Illeris, K.

Project work is an active form of learning, where the participants, in an interchange of theory and practice, study and treat a problem in the real social context in which it occurs. The book is aimed at the whole educational system and gives an account of the social and psychological background of project work, its central principles and possibilities for changing society. An important part of the account consists of descriptions of 14 projects, where participants from all parts of the educational system discuss the content, course of events, and experience from their own project work. Finally, it gives in a short easily accessible form a considerable amount of practical advice and instruction on all facets of project work - though without solving the problems for the reader. It concludes with a selected and annotated literature list.

DPI 1977.2

From "orientation" to "contemporary orientation" (social studies)

Hans Jørgen Kristensen

In Denmark the school subject "orientation" was compulsory in grades 8-10 up to the beginning of August 1976 when it was replaced by a new subject called "contemporary orientation" - a kind of social studies. This new subject has aroused much discussion among teachers and has become a matter of public interest. A topic of this discussion is whether the school is able to teach the new subject.

The purpose of this report is to point out some of the problems arising from this change. The starting point is an examination of the goals and the curriculum guide for the subject issued by the Danish Ministry of Education. The curriculum can be characterized by:

1) Some criteria for the choice of subject matter
2) A principle of working with contemporary problems in such a way that the pupils feel involved
3) A principle of interdisciplinarity
4) A principle of pupil involvement in the choice of subjects and working methods.

In order to give an impression of the teachers' innovation problems, classroom observations of 300 lessons in 45 classes (forms 9-10) have been analysed and described as to the four points mentioned above. The conclusions of this examinations are:

1) The innovation problems are very different for different teachers.
2) About 1/2 of the teachers teach subject matters very much in accordance with the curriculum guide for "contemporary orientation".
   About 2/5 of the teachers will face great problems because they will have to change their teaching from subjects within history, geography and biology to contemporary problems.
3) About 1/3 of the teachers have conducted some sort of problem-oriented work.
   About 2/3 of the teachers have not, and will face some innovation problems here.
4) About 1/2 of the teachers have conducted interdisciplinary work.
   About 1/2 of the teachers have not, and will face innovation problems here.
5) About 1/3 of the teachers have involved their pupils in the choice of subject matters.
   About 2/3 have not.
   About 1/2 of the teachers have involved their pupils in the choice of methods.
   About 1/2 of the teachers have not.

The report concludes that about 1/3 - 1/2 of the teachers have good possibilities of teaching the new subject, while the rest of the teachers will face great problems when trying to change their teaching.

DPI 1977.3

Orientation Teaching in Grades 3-6

Poul Erik Jensen

This report gives a description of the teaching of the subject "orientation" (that is history, geography, geology, biology and social studies) in forms 3, 4, 5, and 6 in the Danish school. The description is based on classroom observations of 469 lessons in 80 different classes during the school years 1974/75 and 1975/76.

Part II of this report outlines some general aspects of the teaching. These are discussed and some interpretations are emphasized:

a) More than half of the teaching was organized as class work.
b) Teaching allowing the pupils to work with projects was not seen at all.
c) Individualization in which the pupils were working with different materials and different activities was hardly registered at all before grade 6.
d) Situations involving the pupils' self-activity were quite limited.
e) Information from the teacher, the pupils' individual work in workbooks, and the teacher's examination of the pupils took up about 75% of the time.

Part III of this report gives an account of an analysis dealing with the influence on teaching methods and use of materials seen in the light of the number of orientation lessons the teacher has with the class concerned per week. The results show a rather significant connection which can be summarized into two different patterns:

One pattern was teaching mostly following a textbook. It was not individualized, and the pupils rarely sought information or read individually and had minimal influence on their work. This pattern covers the major part of the teaching in classes where the teacher had less than five lessons per week. When the teacher's number of weekly lessons in the class increased, this pattern was less frequently registered.

The other pattern was a teaching of broad themes (often themes of history, geography or biology) on the basis of different kinds of material. This pattern included a certain amount of individualization, some pupil activity, and allowed the pupils some influence on their own activities. Various kinds of teaching materials were used in this pattern. It is significant that this pattern was more frequently registered when the teacher's number of weekly lessons in the class increased.

DPI 1977.4

The Rasch Model for Questionnaires with a computer program. Second revised edition

Peter Allerup & Gordon Sorber

Around 1960, G. Rasch developed some fundamental principles for measurement, expressed through 'specific objective comparisons', which had important consequences for the development of a class of mathematical-statistical models.

The decisive innovation was the demonstration of a unique correspondance between some verbally expressed requirements for measurements or comparisons which are objective according to particular criteria on the one hand, and the mathematical formulation of a statistical model on the other. Within the field of psychometrics this discovery made a definitive break with the classical analytical methods: factor-analysis, correlation-analysis and regression-analysis.

In the years following, the models were developed further seen from a mathematical-statistical point of view. It rapidly became clear that the simple mathematics connected with the basic model are considerably more complicated when model control is to be carried out, when the initial parameters are to be estimated or when comparisons between various groups of data are required.

The report consists of two parts. A theoretical description of the principles behind the models together with the necessary mathematics, and an example of the use of a computer programme which solves numerically the theoretical problems. The programme is written in Univac FORTRAN-V and the report includes a listing.

The publication was issued in 1975 and was sold out by the end of 1976. The recently issued second edition is extensively revised, especially the programme-technical part.

DPI 1977.8

The home room teacher as the teacher in mother-tongue language, grades 1-2

Mogens Jansen

An account of the aim of teaching reading in the two first school years seen in the light of the continuously changing demands the society places on the school.

After a short review of the two first reading phases (rebus-reading and transitional reading phase) the possibilities for checking are discussed. The reading phases mentioned are put into the context of types of teaching material.

DPI 1977.13

The Marke-Nyman temperament scale; evaluation of transferability by use of the Rasch item analysis

Peter Allerup, Per Bech & Raben Rosenberg

The purpose of this study was to test for transferability of the MNTS[x)], i.e. the possibility of using the sample of items as an objective instrument for measuring differences between persons or groups of persons. By use of the Rasch model (Rasch (1960)) we could demonstrate that all 60 items of the MNTS taken together constituted no single dimension,

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x) Marke-Nyman Temperament Scale

stressing the fact that score-values based on all 60 items may be useless. Furthermore, when the three groups of 20 MNTS-items, each representing the three Sjöbring dimensions Validity, Stability, and Solidity were analysed separately, the Rasch model was again rejected, indicating lack of transferability.

Hence the dimensions measured by the MNTS do not satisfy the conditions of being an objective instrument, and score-values based on these original scales consequently contain no precise information concerning the persons. However, it was demonstrated that the lack of transferability was caused by particular items on each of the original scales.

The subscales of the MNTS selected by Perris (1966) were also found not to fit the Rasch model, indicating lack of transferability for these subscales. However, only two items on each of the three Perris subscales caused the lack of transferability. These remaining 8-item scales (the reduced subscales) for each of the three Sjöbring dimensions did not reject the Rasch model, demonstrating adequate transferability. In our analysis we have used such properties as age, sex, and disease when testing for transferability. However, from our findings it is not possible to elucidate to what extent the excluded items were perceived by the patients, implying ethical, moral, or social interpretations, for example, when such types of traits were not asked for in the items. It is well known that cues with implications such as good or bad, worthy or unworthy should generally be avoided as they will be perceived unpredictably in different groups of persons, diminishing the transferability. In this connection we must emphasize that Sjöbring based his theory on clinical observations including both reported and observed items. As a questionnaire the MNTS covers what can be obtained from self reports, and a closer look at the eight items for each dimension (Appendix) will show that they still cover much of the range of the original descriptions by Sjöbring. Furthermore the items selected in the three reduced subscales correspond well with the core units of the Smith questionnaire, based explicitly on Sjöbring's three personality dimensions (Smith, (1960)). Thus the transferability found in the reduced sub-

scales supports a psychological relevance more than a simple statistical contamination.

Transferability is a necessary condition for using a scale as a measuring instrument when summing the items into total scores, and transferability therefore plays an important role for scale evaluation and improvement. The 8-item reduced subscales of the MNTS found in this study not only had adequate transferability, but they also covered much of the self-reported components of the three Sjöbring personality dimensions. Those subscales should be taken into account in future research with the MNTS.

DPI 1977.14

Reading Development in children in form 2 - measured by OS 400 in February 1973

Mogens Hansen, Svend Kreiner Møller, Søren Spelling and Arne Søegård

This report has been published as Monograph No. 12 from the journal 'Skolepsykologi'. The study, which is based on material consisting of the replies of 1600 pupils to the test in silent reading of words OS 400, came about by co-operation between the author of the test Arne Søegård (formerly of the municipality Lyngby-Taarbæk school-psychology office), Mogens Hansen (the municipality of Lyngby-Taarbæk school-psychology office), Svend Kreiner Møller (The Danish Institute for Educational Research, DPI) and Søren Spelling (DPI).

When DPI became involved in the study the material had already been collected. Our contribution has therefore been the statistical analysis of the material. This analysis has i.a. consisted in studies of the characteristics of the test itself and of differences in the reading of boys and girls, just as

reading is put into relation to social background, geographical position or school size. On a number of points comparisons have been made with a study from 1966-67 with the same test.

It should be noted that the study covered only pupils in form 2 in February 1973. Thus it has been possible to obtain a good deal of numerical material to study the relations discussed, whilst the study from 1966-67 was spread over 11 terms from form 1-3, since the main aim of the study was to collect standardized material. Thus some of the conclusions cannot be considered applicable to other than 2nd form pupils.

The study showed i.a. that attainment for both boys and girls is lower in 1973 than in 1966-67, that boys are behind girls, and that children in Jutland (except South Jutland) are ahead of the rest of the country.

DPI 1977.15

On grading problems

Finn Rasborg, Jesper Jensen, Gustav Leunbach (eds.)

Part I. Evaluation and Social Aspects

In chapter 1 in 'Some characteristics of the history of marking' the history of some marking systems is described as an integrated part of the history of the education system and the society. An account is given of some main trends in the development, especially in the area of the Folkeskole (public primary and lower secondary school).

Chapter 2 'On the usefulness of marking' the informative value of the marks, their consequences for teachers, the pupils, the teaching and for the society is discussed. In addition the consequences of using marks as prognoses for the future development of the pupil are examined.

In chapter 3 'For and against marking and examinations' a number of arguments are discussed - nepotism, the examination as an expression of the society, on the pedagogical function of the examination, on the validity of the examination, on the examination as a quality control etc.

In chapter 4 'Examination of the examination' the examination is seen as one of the initiation ceremonies of society, i.e. a ritualised test of proficiency. In the article the functions of the examination system are examined from three points of view: 1) Recruitment functions, 2) Pedagogical functions, 3) The power exercising function.

Part II. Marking and the Examination

Chapter 5 'Some problems in evaluation and marking' shows the connection between the objective and the subjective elements in marking, especially through analyses of the relation between evaluation of written tests, which are part of the evaluation system, and the final evaluation. Most of the numerical examples are based on a school system which no longer exists - namely the division examination classes (6-9 forms) and non-examination classes (6-9 forms) under the School Acts of 1937. What is remarkable is that despite the new school system exactly the same problems pertain with regard to evaluation. Erik Thomsen's article is therefore still relevant, and the aim of these examples is to illustrate conditions which are still equally important.

Chapter 6 'On evaluation scales and the 13-scale in the Folkeskole' is introduced by some general observations on evaluation scales, including a calculation of pass-levels etc. based on numerically expressed scales, followed by a discussion of the latest official rules on marking scales in the Folkeskole based on their relation to aim-related and norm-related use of scales.

Chapter 7 'Evaluation in general and further education' compares the use of the 13-scale in the primary school with

its use in the higher forms of education. In the primary school sorting is seen as a main purpose, in the field of higher education, subject characterisation and specialisation.

Chapter 8 'Aspects of the problem of marking' gives an account of the numerical accounting of number of mistakes and other scoring results in tests, and sets out some possible principles for marking based on these results. A distinction is made between 'evaluation', a numerical expression of test performance, and 'reward' - the marking. In addition attention is drawn to the objectivity problem.

Chapter 9 'On external evaluation in the Folkeskole' connects the regular achievement tests in the Folkeskole with the process of development for the individual pupils, as shown by the results of repeated achievement tests; and the rules on marking in the Folkeskole are examined on the basis of general principles of measurement. In the article those requirements are pointed out that must be fulfilled in order that an evaluation can be said to be 'specifically objective'.

The analyses in this article have not been intended as a further contribution to the debate on how far external evaluation should be carried out with the aid of tests or not. On this point is commenced with the wording of the Act on the holding of such tests.

Some prerequisites for this kind of evaluation are pointed out. The conditions applying to the use of the 13-scale are particularly emphasized. More generally, what formally is implied by the requirement of 'objectivity' in the external evaluation is examined. An account is given of what characteristics an instrument of measurement, e.g. a marking scale must possess in accordance with this. The last part of the account is solely concerned with one person in a single test-situation.

Part III. New Perspectives

In chapter 10 on 'Self-criticism and criticism from others' a number of experiments are described with critical process and product evaluation and improvement from the 1890's up to the present.

In chapter 11 'Evaluation as a reciprocal pedagogical influence between the teachers and the students' methods of evaluation and principles in a university course are discussed both as a marking system and as a reciprocal pedagogical influence - i.e. the points of view that are the main theme of part III.

In chapter 12 on 'Evaluation of the process of education' a suggestion is formulated, with reasons, for a scheme - a pedagogical response - that can create a framework for evaluation procedures which aim at incorporating the evaluation as a pedagogical element in the education process. The scheme suggested can also fulfil the requirement of external information on the student.

In the evaluation that aims at assessing pupils, one must be concerned with the proficiency of the pupil and be aware of what proficiency is. In chapter 13 'On the concept of proficiency' it is emphasized that it is necessary to consider the very wide-spread pedagogical-psychological opinion of the society as to what constitutes the concept proficiency. The choice that is made between different concepts of proficiency will have a decisive effect on the validity of the evaluation and its importance to students, teachers, and parents.

Authors of this publication in alphabetical order:

Vagn Rabøl Hansen, Jesper Jensen, Jørgen Aage Jensen, Gustav Leunbach, Thomas Nissen, Sten C. Poulsen, Finn Rasborg, Georg Rasch, Erik Thomsen, Sven Thyssen.

DPI 1977.16

Evaluation in order to plan and improve the educational progress of pupils and students

Finn Rasborg, Jesper Jensen, Gustav Leunbach (eds.)

Part I

Chapter 1 'Everybody goes around evaluating'. The everyday practice of evaluation without much thought behind it often takes place in connection with daily hurried considerations, decisions and actions on an unconscious level, or on a low level of consciousness. This manner of assessment can affect the evaluation in education. On this background, two questions can be raised for consideration and debate: Should teacher-training teach teachers to evaluate in education? Should their upbringing and education teach children, young people and adults to carry out evaluations? (Finn Rasborg)

Chapter 2 'Internal evaluation - "natural methods" as against "evaluation-bureaucracy"' deals with the attitude of teachers to the use of schemes and other formalised time-consuming methods which are foreign elements added to the teaching process (e.g. questionnaires and tests) - in contrast to time-saving methods which are parts of the teaching process and therefore can be used for evaluation during the process of education. (Finn Rasborg)

Chapter 3 'Internal evaluation - whilst the teaching takes place' points out some factors that must be taken into consideration in evaluation in the course of the teaching, i.a. the relation between subject content and internal evaluation, and the relation between forms of organisation (patterns of work, working processes) and internal evaluation. Three forms of evaluation are distinguished: 'The ordinary evaluation', 'evaluation with the aid of test service centres and EDP-scoring' and 'evaluation as part of the educational process'. (Finn Rasborg)

In chapter 4 'Teaching aids and internal evaluation' a number of requirements are set up for teaching aids which can be used in 'evaluation as part of the teaching process'. It is suggested that teaching aids are provided with a description which reveals the leading tendencies in them. Finally, aspects of the co-operation that is necessary to develop teaching aids with built in 'evaluation as a part of the teaching' are pointed out. (Finn Rasborg)

Chapter 5 'Pupil-evaluation and standardised proficiency tests' connects the problems in the use of evaluation scales based on aim-related or norm-related principles with evaluation on the basis of standardised proficiency tests - but stresses at the same time the difficulties involved in constructing relevant proficiency tests. (Gustav Leunbach)

Chapter 6 'From standardised proficiency tests to general guiding tests' sets out the reflections that around 1970 led The Danish Institute for Educational Research (DPI) to attach more importance to general guiding tests in Danish and arithmetic. The article consists of excerpts from the documents of the period on this question (Erik Thomsen, Agnes Kartholm, Børge Prien. Edited by Gustav Leunbach).

Chapter 7 'What can be evaluated in the daily Danish teaching?' describes a number of teaching activities in Danish in the Folkeskole (public primary and lower secondary school) and sets out possibilities for evaluation of the pupils' attainment in relation to these activities. (Mogens Jansen and Svend Kreiner Møller)

Also chapter 8 'Some descriptive dimensions for fluency tests' deals especially with attainment evaluation in language teaching - both mother tongue and foreign languages. The point of departure is ambiguity in the concepts written and oral testing, particularly in languages. (Gustav Leunbach)

Chapter 9 'Alternative forms of evaluation in the school' puts the evaluation of pupils into a psychological and pedagogical whole, in which teaching and evaluation cannot be separated into two independent activities. (Sven Thyssen)

Chapter 10 'Evaluation of project work' deals with project work especially in higher education, but also at lower levels. Evaluation is seen as closely connected with the teaching and learning activity. (Carl Holten-Andersen and Sten C. Poulsen)

Chapter 11 'Development of internal evaluation in an educational institution' sets out various strategies which in an educational situation can be used for the implementation of internal evaluation. It is suggested e.g. that all teachers in an institution together begin internal evaluation on the basis of the same set of evaluative questions - so that a common background is created as a basis for discussion of the further development of evaluation. (Finn Rasborg)

Part II: Evaluation of educational systems - to improve the educational institution and the teaching aids

This part is introduced by chapter 12 'Educational systems can be evaluated - system evaluation in practice'. This chapter describes a non-structured system evaluation and a 'theory and study-group-structured form'. The first is difficult to carry out, but a more obvious choice, because it has been popular for a number of years. For the 'theory and study-group-structured form' reference is made to a number of solid foundations on which to work. (Finn Rasborg)

Chapter 13 'System evaluation of the openness/closed-ness of the school' gives a basis for analysis and evaluation of openness/closed-ness in the inner organisation of the daily teaching in the individual school - and of the school's openness/closed-ness towards the society outside. (Vagn Rabøl Hansen)

Chapter 14 on 'The evaluation of teaching materials' is an account of a number of systematic analyses of teaching materials for Danish and foreign languages. The aim is that the individual teacher should be able to evaluate materials in a similar way. (Mogens Jansen)

Chapter 15 'Evaluation of an advisory system in a "Gymnasium"' (upper secondary school) describes a system-evaluation of the educational and therapeutic work of the school psychologists in a Gymnasium. (Mads Hermansen)

Chapter 16 'Analysis of evaluation in some teacher training schemes' analyzes the official rules for evaluation in an educational institution on the basis of some pedagogical models. (Peer Mylov)

Chapter 17 'Evaluation of the Folk High School' points out some opinions on the external evaluation in relation to the Folk High School. In addition, a number of questions are raised regarding internal evaluation of a Folk High School. (Carl Holten-Andersen)

Chapter 18 'Internal and external subject-criticism' at the university describes the system-evaluating criticism that can be levelled against university education, by the students, the teachers, the graduates and the recipient institutions. (Sten C. Poulsen)

Chapter 19 on 'Centralisation/decentralisation: system-evaluation' gives a practical guide to system-evaluation of existing or future plans for organizing the school system in the municipality and the county levels. The chapter points out three bases for analysis: the making of a school building plan; the finished plan; effects on pupils, teachers and parents. (Finn Rasborg)

Chapter 20 on 'Before system-evaluation becomes impracticable' deals with some of the difficulties that can appear in the

course of the work with system-evaluation and points out several possibilities: Help yourself? Help to self-help? Give up? (Finn Rasborg)

DPI 1977.17

Selective admission (numerous clausus) and education

Ole Bredo & Sven Thyssen (eds.)

A team at The Danish Institute for Educational Research (DPI) have analysed the problematics of selective entry and education from a pedagogical and psychological point of view. This is an analysis which examines the connection of the problematics of selective entry with other factors in the field of education, the school, the history of the education system, the understanding of ability, statistical theory, etc.

DPI 1977.18

System evaluation - within a section of the school

Mads Hermansen

The present report gives a survey of the organization of psychological assistance at a county upper secondary school (Dan. Amtsgymnasium). Two fields of activity are described: 1) pedagogical-psychological activities and 2) clinical-therapeutical activities. The arrangement is evaluated by

the psychologist, the special teachers involved and all students at the school. The students gave their opinion by answering a questionnaire (student-evaluation).

The organization of an experiment with special education is described in connection with the pedagogical-psychological field of activities. 11 cases are reported.

The results of the student-evaluation are presented, and it is noticed i.a. that there is a remarkably high degree of acceptance of the offer of special education. Further there is a reasonably high knowledge of the offer. 10 students asked for exemption from the rule that the sum of the two lowest marks plus the average of the rest must be 13 in order to consider the final examination ('studenter' or 'HF')[x] as passed. 7 students of the 10 mentioned above came from the HF course. 6 of these had received special education in primary school.

Based on this investigation and experiment it is suggested that special education in lower secondary school is made a permanent arrangement. It is also suggested that this special education should be carried out by specially trained primary school teachers.

In the clinical-therapeutical field of activities the efforts have been concentrated on assistance to students with acute psychological or social problems. 7 students applied for assistance of this sort.

The results of the student-evaluation show that there is a high degree of knowledge and acceptance of the therapeutical offer among the students. It also shows that in addition to psychological assistance some kind of social guidance is required as well.

Based on the above it is concluded that there is a need for psychological assistance in the carrying out of pedagogical as well as therapeutical work.

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x) Studentereksamen = upper secondary school leaving examination
HF = Higher preparatory examination

4 models for a permanent programme for psychological assistance at upper secondary schools are described. Model 1 implies that the psychologist is employed as school-psychologist at the local school-psychological office. Model 2 implies that the psychologist is employed by the local welfare authorities. Model 3 implies that the school psychologist is engaged part-time as a consultant at the upper secondary school. Model 4 implies a combination of models 1 and 2. Generally the argument is in favour of model 4.

Finally it is demonstrated by the student-evaluation that there has been a prevailing satisfaction with the information given on the programme and with the fact that the programme is generally available.

Consequently, it must be concluded that psychological assistance meets a need.

DPI 1977.19

On Consciousness-Raising in the Women's Liberation Movement

Inger Agger

The development of consciousness-raising in the USA and in Denmark is described. Two American and one Danish technique of consciousness-raising are critically studied. Problems in the work-process of consciousness-raising groups are further analysed in a discussion of the relations between consciousness-raising, therapy, and education.

DPI 1977.40

On Education

Jesper Jensen and Steen Achton

Contents:

1. Why education?
2. What is education?
3. What is a human being?
4. What can the school be like?
5. Education: influence or cognitive process?
6. What is an educational cognitive process?
7. Contradictions in today's education.
8. Education, production and economy
9. The educationist and the society.

DPI 1977.41

Developmental curves through item analysis

Peter Allerup, Peer Mylov & Søren Spelling

The publication is orientated towards the solution of a number of theoretical and methodical problems of a pedagogical-psychological and mathematical-psychological nature. These problems have shown themselves to be principle barriers to a pedagogical analysis and evaluation of a field experiment, concerned with i.a. the starting point for one of the subjects in the Folkeskole (English). An earlier publication (Mylov & Møller, 1975) dealt with the particular difficulties that were connected with bridging five different English tests. The result of this work was individual development curves which show the pupils' development in the subject English.

The report deals with the tests in Danish for the same two year-groups of pupils in the municipality where the study took place. Since the tests were the same each time it was reasonable to look more closely at the basis for the construction of the individual development curves. For the English test at the time of analysis, only a registration of the total number of correct solutions for each pupil was available; in the case of Danish silent reading the number of completed questions for each pupil was available, which made it possible to define two dimensions in the pupils' performance.

Difficulties due to the lack of registration of the individual answer-patterns were overcome by including some earlier material which permitted evaluation of the individual questions in the silent reading test (F III). One of the dimensions in the pupils' performance, namely the speed expressed by the number completed, was in this analysis found to be less important than the pupils' ability to answer the test questions (F III). Therefore, the number of correct answers for each pupil became the starting point for an analysis that could give an estimate of the pupils' ability to read and answer the questions in the silent reading tests, when the number of completed items was taken into consideration. Pupils with a different number of completed questions (items) can thus have the same 'reading strength', and the individual pupil's position in this dimension, independent of the level of the other pupils, became the central theoretical-empirical basis of the publication.

The graphic development curves and the other graphic presentation of the individual pupil's 'reading strength' at the three times of measurement could then be used to answer the original question in the field experiment. Especially this: Is it better to begin relatively early with English teaching, when the total number of lessons remains constant?

Since Danish teaching was also changed, and since competence in Danish could be considered to play a part in the learning of a foreign language, development curves through item analysis shed light on this problem by drawing conclusions about the development and levels for those year-groups of pupils. In addition, the division of pupils into streams is evaluated, which especially for one of the year-groups was the usual practice in the school.

The starting point for the subject English has long been decided in the Danish Folkeskole Act, and the conclusion of this report can be interpreted as supporting the earlier start which has taken place.

More generally, the report clarifies theoretical and methodological problems in studies of school structures, where the criteria are sought in the concrete development of pupils and competence in the subject areas of the school.

DPI 1977.43

On Specific Objectivity

Georg Rasch

The paper deals with the concept of comparison as a fundamental principle of scientific research. In an observational set-up (possibly an experiment) the observed outcome varies with different objects taking part in the "contact" that produces the outcomes, and a comparison of two objects is defined as a statement about the two corresponding outcomes.

A comparison is called global if the statement depends on the two objects that are compared, but not on the other entities which take part in the contact.

For a system of global comparisons the term specific objectivity is introduced - "specific" referring to a specified frame of reference within which comparisons are defined.

From the simplest systems described, the description is extended in one direction to dynamic systems where contacts form a sequence (e.g. a time series), and in another direction to systems with random variation where a given contact does not produce a given outcome, but only a probability distribution over possible outcomes.

DPI 1977.45

Research planning - a development process

Finn Rasborg

Improvement of planning requires a developmental process where existing planning, its advantages and disadvantages, is analysed first - on the basis of experience. In this phase it is important to distinguish between the experience of many years with various forms of research planning on the one hand, and ideal conceptions and airy desk-theorisation on planning on the other.

When the advantages and disadvantages are pointed out there is basis for putting forward suggestions for improvement.

These suggestions for improvement must be tried out in practice in order to gather experience as to which aspects of the suggestions for improvement work and which do not.

On the basis of this experience new suggestions for improvement can be put forward which must then be tried out, etc.

More general statements on the necessity of planning can easily be agreed upon. But agreement can soon come to an end e.g. by requesting answers to questions such as these:

Which aims should control research?
Who should control research?
How can the content of research be planned?
Which planning methods should be used?
How should the various planning possibilities be combined?

A distinction can be made between various phases in Danish research planning: 1) Laissez-faire planning, 2) A demand for an extension of research versus general debate on the planning of research, 3) Theoretical demands for more precise planning of research, 4) The specified research planning in practice.

Among several planning principles the following i.a. can be distinguished:

Direct planning is that which is directly imposed on the institution or researcher to be steered in one direction or the other. Thus here it is clear who the planner is, who the person subject to the planning is, what is required to be planned in the research-content or process, and how planning is carried out.

In indirect planning the planner is veiled or hidden. Some of the planning methods come out into the open, whereas others are used behind the scene. This kind of planning can be called 'open and undisclosed agenda', and there are such detailed descriptions of it that I will not go further into it here.

In chapter 2, a number of higher aims are described which should be included in an analysis of research planning:

The higher socio-political aim.
The educational aim.
General research aims.

International co-operation - give and take.
The development of science.
Higher education - and other forms of education.
The demand for relevance to the society.
The demand for research as conserving or socially critical.
'Profitability'

In chapter 3 a list is set up of the authorities or persons who plan or have the possibility of planning Danish research distributed among the following main groups:

1) Government, county and local authorities.
2) Interest organizations and pressure groups.
3) The 'researcher community'.
4) Private industries.

In chapter 4 a number of phases in the research process are discussed, and for each phase the way in which desirable and undesirable planning can take place:

Recognition of problems, formulation of problems for the research project, mapping out of conditions for the research project, planning during the preparatory stage, implementation phase, planning of the working phase, adjustment of results and annulment of results.

In chapter 5 an account is given of the following methods of research planning:

1. Planning by means of differences of distance in the state and organizational decision system.
2. Planning by means of economical and other resources.
3. Planning by means of recruitment of research workers.
4. Planning by means of command, dialogue or spontaneous consensus.
5. Planning by means of moving research institutions and resources to different regions of the country.
6. Planning by means of the rule for professors: 50% teaching, 40% research, 10% administration.
7. Planning by means of changes in the composition of groups of research workers.
8. Planning by means of academical degrees (candidate degree, licentiate degree, doctoral degree).
9. Planning by means of distribution of research projects.

10. Planning by means of communication of results of research and developmental projects.
11. Planning by means of research boards, etc.
12. Planning by means of mapping out the research.

It is seen that there are many possibilities of planning research. In this area as in others an efficient planning can be carried out by using one or more of the planning possibilities. It is unnecessary and uneconomical to use many.

A realistic attitude to the planning of research requires that both the desirable and less desirable planning possibilities are stated, so that they can be evaluated: Which planning possibilities are desirable and which are undesirable? How can it be ensured in daily research that measures are taken against undesirable planning possibilities.

If research is to retain its freedom to participate in the advancement of the society and science, it must be ensured that researchers have influence on the choice of research problems, that they have the responsibility for carrying out the studies, and that they can put forward controversial results - without fear of being 'steered out' of research. It is precisely this critical function that makes it necessary to ensure that conditions of employment for researchers are so safe, that they are able to put forward controversial results with confidence.

In the future debate on the development of planning in research it is necessary to include such points of view.

DPI 1977.46

The Development of Danish Orthography

Mogens Jansen and Tom Harpøth

A brief survey of the development of Danish orthography is given from the first attempts to establish a Danish orthography via various orthographical reforms up to the present. The particular problems of the small language area are emphasized, as is the emphasis that traditionally is put on spelling in this country as 'part of the culture criterium'.

DPI 1977.47

Visual problems in school children. - An orientation with special reference to vision and reading

Peer Mylov and Werner Regli (eds.)

With its starting point in the debate that began in the Folkeskole (public primary and lower secondary school) in 1975 concerning remedial assistance to retarded readers by means of glasses, and the discussion which a possible prophylactic work through the immediate distribution of glasses would result in, the National Association of School Psychologists set up a working group in 1976 with Anders Poulsen as chairman, to investigate the problems.

The people selected for the working group have a strong position in their own organisations, which i.a. meant that professional group-political differences had to be overcome side by side with the clarification of the problematics involved in vision, reading and glasses at school age.

Such a wide interdisciplinary study with such a wide representation from professional organisations has not taken place in Denmark before, or in the Nordic countries.

The group has, with the support of the Danish Ministry of Education, published a short paper, which has been designed as an experimental structural clarification of vision care in the Folkeskole. The paper could also form the introduction to a research and development project with special reference to the problem of glasses and reading.

The working group found that in the fields of both education and medicine there is a lack of basic, general orientation on the problems connected with vision care in schools. It must also be recognized that interdisciplinary co-operation on the problems of the individual child could be improved in many areas.

The aim was to contribute to:

- the clarification of some issues concerning the connection between reading and visual problems.
- encouraging all groups involved to be more aware of the existing problems and to carry out their work objectively in open co-operation with all those who have a responsibility for the development of the individual child.
- removing a number of myths and prejudices which have flourished in the area.

The publication contains the following headings:

Preface 5
Introduction 8
Advice to the teacher 10
Visual defects and reading difficulties 10
Visual problems and well-being 10
Co-operation between the teacher, school health care and the school psychologist 11
The role of the teacher in vision care - and what can be observed 11
The most frequent causes of visual problems 13

The school doctor and optometry 14
The medium - the printed symbols 14
Reading and the visual process 14
Visual impression and visual perception 15
Correction of vision 16
The task of the school psychologist 16
The school doctor and vision care 17
Aim 17
Method 17
The school medical examination 18
Various refractory errors 20
Short-sightedness (myopia) 21
Structural defect of the eye (astigmatism) 21
Different refraction in each eye (anisometropia) 22
Reference to specialist examination 22
The routine of the school doctor 23
Teaching in vision care 23
Children and glasses 24
Prescription and the use of glasses 24
Vision and binocular training 24
Reduced vision 25
Subjective difficulties other than reduced vision 26
Visual strength (visus) 28
Visual test cards 28
Spectacle glass 29
Pupil descriptions 31
Children with visual handicaps 31
Children with visual problems 33
Children with reading difficulties/visual difficulties 35
Word list 37

The following can be quoted from the publication:

Visual defects and reading difficulties

From time to time considerable interest is created in the visual function in relation to reading, and it is contended from various quarters that visual difficulties can be of decisive importance for reading ability.

Up to the present there have been no studies which determine with certainty that visual difficulties are the direct cause of reading difficulties.

Reading difficulties can therefore hardly ever be resolved exclusively with the uses of glasses.

The following appears later in the publication:

The medium - the printed symbols

It is natural in connection with reading that one immediately experiences how important it is to be able to see in order to be able to read. The basis of reading is a set of symbols which must be seen, perceived via the eye. Many people have had to recognize that they need glasses if they are to read satisfactorily, and 'reading glasses' is a generally known concept. It is easy to observe that it is necessary to see to be able to read. It is more difficult to gain knowledge and experience where the very complicated central processes which together constitute reading are concerned. Thus interest is concentrated on the least important, the visual side of the reading process, and this often takes place at the cost of the important, complicated central processes.

Reading and the visual process

This exaggerated interest in the 'medium' (i.e. the printed symbols = letters) is found embedded even in professional groups. Marianne Frostig, for example, considers reading as primarily a visual process. The same point of view is found among some school psychologists and reading teachers. But this is not how it is.

Reading is primarily an interpretative function, not a visual process. If reading was primarily dependent upon sight, braille-reading by the blind (tactile reading, 'finger reading') would be impossible. Experience shows that braille-reading and ordinary reading despite the different sensory channels have the same common characteristics. The difficul-

ties experienced in braille-reading are remarkably similar to those we know from ordinary reading.

If the reading process was highly dependent upon the functional ability of the external sensory apparatus, the reading of the weak-sighted should have some special characteristics in common, directly connected with reduced vision. But international and Danish studies show that even strong reduction of vision does not prevent efficient reading, and we have to go down to the 'defined as blind' area before a visual reduction in itself has a decisive influence on the reading process, and in such cases it is nearly always the quantity (low reading speed) and less often the quality (few mistakes) that is concerned.

In this connection it can be mentioned that visual difficulties (low vision and blindness) are in general not as decisive for a child's ability to function in a normal teaching situation as is often assumed. In Denmark practically all low vision pupils are taught in normal classes, and the blind can be taught in ordinary classes when appropriate support can be arranged.

Visual impression and visual perception

However, in order to study vision and reading in depth, it is necessary to consider how the sensory impressions received are perceived. Even though the external sensory apparatus is weak, this does not necessarily result in difficulty with the central processing. Studies and experience show that the processing can be satisfactory even though the sensory basis is weak. On the other hand, the school psychologist has experience of many cases where despite perfect vision, difficulties can occur in the perception of the visual impressions.

If reading were primarily a visual process, it could be expected that the group of retarded readers distinguished itself from the group of normal readers with regard to the

ability to process received sensory impressions. But it is the general experience in school psychology that retarded readers as a group are no different from normal readers when concerned with solving problems requiring the use of sight, e.g. jigsaw puzzles, finding missing things in drawings, putting series of pictures in order, finding similarities and differences, perceiving pictures.

It is thus a well-founded postulation that the role of vision in the reading process is modest.

In the section children and glasses the following can be found:

'Most long-sighted children, also those who use glasses, have a permanent accomodation which is not completely relaxed even when a lense is held in front of the eye to compensate for the accomodation. That part of the accomodation which the individual cannot relax thus masks some of the long-sightedness. This is called hidden long-sightedness (latent hypermetropia). This latent hypermetropia can only be revealed by the use of eye drops which can relax the accomodation.

Among professionals there are divided opinions as to how to prescribe glasses for long-sightedness. The accomodation can compensate for long-sightedness up to +10,00 diopters - +15,00 diopters for shorter periods. This should be an argument against correction for slight cases of long-sightedness, e.g. +1,00 diopter.

There is however a great amount of practical experience to show that many children with the above difficulties feel that they are helped considerably even by weak glasses for long-sightedness. It is therefore justifiable and reasonable to correct for weak long-sightedness when the symptoms are present.

All treatment has a built-in effect, the so-called 'placebo effect' which for some medicaments has been calculated to

20-30%. There is also a placebo effect in glasses. It is, however, characteristic for a placebo effect, that it is seldom of a long duration. Glasses for long-sightedness are mostly intended for close work. Some children, however, prefer to wear their glasses all day, and they should naturally not be prevented from doing so.

A few children need such strong reading glasses that they cannot see clearly at long distances. These children should perhaps be provided with double-lensed glasses (bifocals), but these cases are exceptions.

A normal sequence in connection with weak glasses for long-sightedness is that the glasses are used for 2 or 3 years, when they then become superfluous, due either to the growth of the eye or because the inconveniences disappear, despite unchanged long-sightedness.'

DPI 1977.49

The written tests after the compulsory education - some tendencies

Mogens Jansen and Peter Allerup

The publication on the written tests in Danish at the end of the 9th school year is based on two main tendencies:

1. 'The dictation exercises for the leaving examinations of the Folkeskole after the 9th form have become easier.'
2. 'It has become easier and easier - measured by number of mistakes - to obtain the mark 8 (the "middle") in dictation.'

The first statement has been evaluated against dictations with the help of LIX - a measure of the degree of difficulty of the readability of the text, since this method of measurement had been used as the basis of a criticism of the attainment of the pupils. It is argued in the paper that the weakness of this statement lies in the use of LIX as an index for the orthographical degree of difficulty. In addition, based on an analysis of all dictations from 1963 to 1977 it can be established that LIX measurements do not uniformly support the sporadic results found earlier on changes in a negative direction in this index. Experiments with other - and perhaps more relevant - spelling-difficulty measurements give the same result: There is no documentation as yet for the assertion that dictations are becoming easier and easier.

In the publication an account is given as to how the examination classes (7-9 forms) over a ten-year period increased its relative share of pupils considerably, whilst classes 8-10 in the same period contributed pupils to the examination classes (7-10 forms) and received pupils from those groups who previously would have left school after the 7th form. Together, these two things mean that the pupil-group in forms 8-10 changed drastically in nature in the course of a very few years. If pupil migration to and from the 8th to 10th forms is compared with 'number of mistakes in spelling in order to achieve an average mark', one has part of the explanation of the relatively modest shift in marks that has taken place in the spelling examination of forms 8-10. On the other hand, no shift in spelling mistakes can be demonstrated in the examination classes (7-10 forms). This means that a number of pupils (presumably pupils with relatively weak academic and therefore relatively weak backgrounds for spelling) have been taken into the examination classes (7-10 forms) without changing the standard of this school form in the period described.

In addition it is pointed out that with the existing methods of analysis it has not been possible to demonstrate

any change in the degree of difficulty of the tests concerned, in the period dealt with here.

In the appendix dictations are reproduced from 2nd form of the examination classes and from the 9th form.

DPI 1977.52

Special Education in Denmark

Mogens Jansen

I: L. Tarnopol & M. Tarnopol (eds.): Reading Disabilities. An International Perspective. Baltimore, Maryland: University Park Press, 1976. Chapter 9, pp 155-174. Reprint 1977.

In a series on Reading Disabilities covering 19 countries, chapter 9 is devoted to a discussion of Special Education in Denmark.

The article is in the form of a summary, and describes the administrative framework for special teaching, the facilities available, tests used, diagnoses etc.

In addition an account is given of methods of remediation and results. A detailed account is given of a case study and a summary of some research projects in connection with special teaching.

DPI 1978.3

Full mixed ability teaching - spot-analysis in Gladsaxe

Jesper Florander, Ole Kjær and Søren Ortvad

In 1973-77 Gladsaxe Municipality carried out research on full mixed ability teaching in forms 8-10. This was a comprehensive research and development project, which to a great extent was started as a result of experience in the municipality with streaming during an earlier experiment with optional subjects. Streaming showed itself to be insufficient in relation to its declared aim, which is to teach homogenous groups of pupils. The streamed groups were no more homogenous, and conditions were no easier for the teachers who taught the streamed classes. The experiment with optional subjects gave experience of mixed ability classes in Danish and orientation, and it was therefore natural to let a new development project concern itself with so-called qualifying subjects.

The mixed ability experiment in Gladsaxe covered therefore the following subjects: arithmetic/mathematics, German, English and physics/chemistry. The aim was i.a. to carry out full mixed ability teaching with differentiation as the pedagogical principle and place the experience gained of the organisation of the teaching, methods and material at the disposal of the other schools in the municipality.

Four schools took part in the experiment, 9 classes, 41 teachers, 145 pupils and 104 parents.

Interviews, questionnaires and descriptions of teaching conditions were used for information on the experiment.

Through interviews the teachers provided information on the course of the teaching, which materials and patterns were used. The local research department reported these interviews.

The pupils were also interviewed in small groups on their opinions on mixed ability teaching. In addition various pupil data were collected i.a. on marks and examinations.

The attitude of the parents to mixed ability teaching and their impression of it was examined via a questionnaire.

Experience from the experiment in Gladsaxe indicates that the possibility of carrying out the principle of teaching-differentiation is connected with the individual subject and its 'traditions'. In Danish and orientation, which has been taught in this way for a long time, the teaching has been differentiated to a considerable extent. In foreign languages (English and German) differentiation has gradually developed in the form of the teacher's increased knowledge of principles for the development of methods and materials. It has been most difficult for arithmetic/mathematics and physics/chemistry where modified class-teaching has been employed to a greater extent. In the latter case a continued collection of experience on the development of methods and materials principles is needed.

A particular characteristic of the experiment was the experience of the pupils in the mixed ability classes. The general impression was extremely positive, since the pupils considered it as natural to continue to study as a group, despite the spread of ability in the individual class. Comradeship is the basic reason for satisfaction with the mixed ability teaching, and an improved academic reward is indicated for a considerable number of pupils.

It also appears from the report that there have not been any disciplinary problems to speak of, and that the social atmosphere in the mixed ability classes has been considerably better than has been the experience of teachers in the streamed classes.

The experience of the parents of mixed ability classes can be seen from some thought-provoking points of view, which in future experimental and developmental work should be attended to - i.a. concerning information and influence on the experimental work.

The experiment in complete mixed ability teaching was at the same time a testing of various conditions for teachers in connection with developmental work. The final report describes time spent in conference, time for co-ordination, consultant support, courses, two-teacher arrangements, split half classes, language rooms, etc.

DPI 1978.9

The Teaching of Reading without Really any Method

Mogens Jansen, Bo Jacobsen & Poul Erik Jensen

The reading teaching that has been developed in Denmark in the last twenty years is special in many ways. This applies equally to the reading teaching at the elementary level, medium levels, and the advanced reading training. It also applies to the way in which one has tried to solve the problem of individualisation in Denmark. Seen with international eyes this development is interesting because Denmark is a limited area where the effect of the method can be described.

What particularly characterizes Danish reading teaching is that it has not been influenced by a particular systematically thought-out method. This is i.a. due to the freedom of method the Danish teachers have, which has resulted in the teachers choosing those elements from the various teaching methods in which they have been able to see advantages. This, seen with foreign eyes, is peculiar, which is reflected in the title of the book.

The book also describes a number of other characteristics of Danish reading teaching, for example the small number of pupils per class, split half classes, that pupils have the same teacher for many years, etc.

Mogens Jansen and Poul Erik Jensen from The Danish Institute for Educational Research (DPI) and Bo Jacobsen, The Institute for Applied University-Pedagogics, University of Copenhagen, have described this Danish methodical tradition. This work is now being published in English with support from the Government Council for Research in the Humanities. It is available from Munksgaard International Publishing House and Humanities Press Inc., New Jersey.

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Integration in the Folkeskole (public primary and lower secondary school) - an economic analysis on the basis of controlled experimental activity

Poul Erik Jensen

Experiments have been made in the integration of handicapped pupils in some Danish schools. This concerns partly an experiment where heavily handicapped pupils are integrated into ordinary schools, and experiments where slow learners and mentally retarded children are integrated into ordinary classes. On the basis of these experiments the consumption of teacher lessons has been calculated.

The development in the Danish school since 1971 has been that fewer and fewer pupils are taught in special institutions or special classes. Thus a slow, steady integration of handicapped pupils is taking place.

Calculations have been made of the extent and speed of this development. On the basis of the resource calculations mentioned above, a forecast is made of the resource consumption for the continued integration in coming years in the Danish Folkeskole.

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Nordic data-base for pedagogical and psychological information and documentation. - A problem summary as a basis for planning

Birger Hjørland and Poul Erik Jensen

The increasing flood of information in pedagogics and psychology, which for a central educational library means an annual new acquisition of about half a million pages, is more than a problem of capacity.

It is necessary to be able to reach the many thousands who are occupied in research, teaching administration and teaching, with the information that is relevant for them on educational research and development.

For those seeking relevant literature the problem is partly to obtain a comprehensive view of the available literature, but also to be able to economize with their own working capacity as well as others in the search for the literature which is relevant.

Therefore work has been going on at the Nordic level to set up a system where the pedagogical and psychological literature is registered by computer, making it possible to make relevant literature searches on the basis of selected key words.

This publication gives a comprehensive view of the problems connected with the transition to computerisation of literature registration and search. The report lists the possibilities to be chosen from when decisions are made concerning such a system.

The report also includes a committee report on the planning, which is being carried out concerning educational and psychological information and documentation in the Nordic countries.

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Theories of Reading Speed and Comprehension

Poul Erik Jensen

Reading and improvement in reading are not clearly related to visual stimulation. Probably this aspect of reading is the least important. Reading is not a limited ability which can be trained in the same way as learning to type or to ride a bicycle.

Reading is a complex cognitive function in which the central aspect is the processing of stimuli taking place during the reading and leading to experiences and thoughts. Different ways of reading exist and each of them results in different experiences of meaning.

A reading course does not only mean working with improvement of reading ability through increasing reading speed and preserving the reading experience. This is far too simplified, but nevertheless almost all research on reading improvement has been based on this simple model. On the contrary, reading skills training means teaching the reader to clarify her/his reading purpose and to evaluate continuously the experience of reading in relation to purpose. The act of reading - eye

movements and processing of stimuli - is adjusted so that the greatest possible concordance is established between reading purpose and experience of content.

The purpose of this article is to argue in favour of a research methodology in the area of reading skills training that will concentrate on the processing of stimuli and phenomenological descriptions of the experience of meaning.

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Teaching patterns in Orientation-teaching in forms 3-6. An illustration of teaching patterns in Orientation-teaching in forms 3-6 and a comparison with teaching patterns in the Orientation-teaching in forms 9-10

Hans Jørgen Kristensen

This is report Number 6 from the "Orientation Project". It is based on classroom observation of 469 lessons in "orientation" (history, geography, biology and integrated themes) in 80 different classes in forms 3, 4, 5 and 6. The observations were made during the school years 1974/75 and 1975/76.

Report 5 from the "Orientation Project" contained a description of the observed teaching based on the statistical analysis.

In this report the observation material is grouped into different types of "orientation" teaching (teaching patterns), similarly to the way the form 9-10 material was grouped in report 2.

Chapter I gives a short account of the general lines for the grouping. Chapter II describes the teaching patterns found in the material. These are:

1. Subject-oriented class teaching.
2. Subject-oriented class teaching with exercises and use of workbooks.
3. Varied "orientation-teaching".
4. Theme-oriented collection of information.
5. Problem-oriented collection of information.
6. Individual work with themes.

In chapter III the teaching patterns of forms 3-6 are compared to those of forms 9-10. The comparison shows that subject-oriented class teaching is far more frequent in forms 3-6 than in forms 9-10. Also it shows that the teaching in forms 3-6 is less varied and many-sided than in forms 9-10. It is obvious to look for a relation between the teaching and the curriculum. This has already been done for forms 9-10 (report 2). In chapter IV the teaching in forms 3-6 is compared to the curriculum that dates back to 1960 and to its 1970 supplement.

For forms 9-10 the conclusions were that there was a close relationship between an open and frequently revised curriculum and an "orientation-teaching" characterized by a variety of teaching patterns. For forms 3-6 the conslusions are that there is also a clear relationship. Subject-oriented class teaching is more frequent than other teaching patterns, and the variation of patterns is limited. So the teaching is well in accordance with a curriculum older than that of forms 9-10 and only revised to a small extent.

Chapter V analyses the correlation between different aspects of the collected data. A clear relationship is found between the teaching pattern and the number of lessons given per week in class by the teacher. Subject-oriented class teaching is seen more frequently in classes where the teacher has a small number of lessons per week, while the other teaching patterns are seen more often in classes where the teacher has a high number of weekly lessons.

A certain relation is found between teaching pattern and content, so that it may with some justice be said that subject-dependent teaching patterns exist.

In some cases a relation is found between teaching pattern and form.

No relation is found between teaching pattern and teacher age, apart from the fact that subject-oriented class teaching dominates the teaching of a small group of older teachers.

Moreover, a tendency of school influence is found, as the teaching in seven schools is dominated by subject-oriented class teaching, the teaching in two schools by varied "orientation-teaching" and the teaching in one school especially by teaching influenced by the pupils' interest and choice.

In chapter VI an attempt is made to give a survey of the explanations of teaching, as they have been described in this and in the earlier reports from the "Orientation Project". The survey is sketched in a model distinguishing between explanations due to

- the teacher,
- the pupils,
- the framework set up on different levels ranging from class to legislation, and
- the interaction between these different factors.

In the survey a number of factors to be borne in mind when efforts are made to change one's teaching are briefly mentioned: The teacher's concepts of teaching, the teacher's needs in the teaching situation seen within certain frames of reference, the curriculum seen in relation to the children's experience, and the nature of the framework within which the teacher is working: curricula, time schedules and organization of the learning experience in subjects, time and space, number of weekly lessons in class, direction and cooperation of the school in question, material resources and the socio-economic framework of the school.

DPI 1978.23

Fill in dictation. A study of spelling errors in the 9th form

Børge Prien

The material studied comprises the answers of 113 pupils to two fill in dictations for form 9. This is a new kind of test, where the pupil has only to write the words that are missing in a printed text, but where the dictation covers the whole text. After the dictation the pupils had the opportunity to use a dictionary.

The words underlined in appendix 1 and 2 are the test words, which had been divided into three types in advance (a, b, c).

The distribution according to number of errors per pupil (appendix 3) shows that about 8% of the pupils answered both tests without errors. Half of the pupils made more than 6 errors per dictation. In a supplementary material from 6 remedial class pupils all made more than 20 errors per dictation, and of 14 pupils from an examination class (10th form) none had more than 10 errors per dictation. In connection with the discussion of these distributions, it has been questioned whether the two tests can be described as equally difficult, and the desirability of control of the degree of difficulty of these tests is discussed with a view to future tests of this kind, which are to be used for evaluation of spelling skills in a pupil group that changes from year to year.

As an expression of the difficulty of each individual test word, their error percentage (f%) has been calculated. This shows how large a percentage of the pupils did not write the word correctly. The f% of the words is shown in appendices 4, 5, 6, 8, in each appendix in combination with various other information.

In appendix 4 the f% of the test words is compared with the advance division into very easy words, very difficult words and other test words (word types a, c, b). The latter word-type (b) has error percentages from 1-56. Most of the test words have error percentages from 1-10.

In appendix 5 all the test words are arranged according to increasing f%, so that it can immediately be seen which words seldom or often are written wrongly by the pupils. A certain specification of the wrong answers is also given, in that unanswered test words, additions of words or division of words, and errors in capital and small initial letters are given separately with their number, calculated per 100 pupils. Unanswered test words are rare, as are additions. Errors in word-division are found in some of the compound words. Most noticable are errors in small initial letters in the Danish words: Dem, I, Gud, and Nationalmuseet, as well as words following a full stop, whilst such errors hardly occur in names of people and appear to a limited extent in geographical names. Errors in capitalization are seen in danske, jyske, and jeres. - Appendix 5 also includes a summary of information from the error analyses of the remaining errors, the compositional errors in that the K-profile shows what percentage of pupils made errors in different parts in the test words. In appendix 6, the alphabetical list of the test words, it can be seen whether a given word appeared in the test words, and in this case which f% it had. The list comprises 186 words and also functions as a list of contents for appendix 8, where the result tables of the error analysis for each of the test words show the errors made.

The procedure for the error analysis is described in connection with appendix 7, where 'Nationalmuseet' is used as an example. With the aid of the skeleton method that has been developed in connection with this study, the errors in each part of the words are described. The letters common to all answers, the skeleton of the word, is determined, and the variable parts between the skeleton parts are described,

showing how each part has been wrongly written by how many pupils. In the result table of the error analysis (F-table) the number of wrong answers for each part of the word is given at the bottom, calculated per 100 pupils (Fph), and summed on the extreme left. The last line, the F-profile, also contains the information mentioned previously on unanswered test words, additions and word-divisions, and errors in capitalization. The profile gives an empirical picture of the spelling structure of the word.

In appendix 8 the F-table for each of the 186 words examined is given. Besides illustrating the difficulties of the individual test words, the error analysis, as a whole, shows some general trends in the pupils' spelling of the test words: Initial letters, apart from capitalization, give few difficulties, whilst errors often occur in word-endings. A missing present tense -r is seen frequently, especially when it follows shortly after another r and this is difficult to hear in dictation with normal pronounciation. The letter r leads to a remarkable number of errors, or errors occur close to an r, just as in older spelling studies. - Based on the examples it is mentioned that the relationship between the sound picture of the word and its visual image has importance for the appearance of some of the most frequent spelling errors, e.g. leaving out unpronounced (silent) letters. The pupils' own pronounciation of the words to be written can also influence the spelling of them.

In a summary of typical errors, examples of errors made by at least 5% of the pupils are given: Besides, the present tense -r, plural -r, plural -e and other inflections can be missing. Within the word silent d and g are often missing, sometimes an e. Other 'misses' consist of halving of double consonants. Among superfluous letters r, g, d, and e are found again. The letter e often appears instead of æ, but also sometimes instead of a or i. Among consonants the rare letter c is sometimes replaced by s. Further, n is written instead of m, and j instead of g. More complex errors are briefly mentioned.

It should be noted that the typical errors are connected to the given examples by conditional factors, which the test words share with some, but not all words in which the letters mentioned in the examples appear.

As conditional factors for spelling errors the following can be mentioned: The concerned letters' position in the word, the relationship between orthography and pronounciation, spelling of words related by meaning and words that sound similar, previous punctuation marks and the frequency of the word in the language.

In the section on the use of the dictionary it is stressed that access to the dictionary has far from meant that the errors have disappeared. A dictionary is certainly not a universal instrument for correct spelling, but can perhaps be made somewhat better use of than previously. Some observations indicate that the pupils must learn to make better use of both dictionary and the printed context in which the test words appear.

Technically, the test type fill in dictation appears to be satisfactory. Finally, a number of unsolved problems are pointed out concerning the relation of this type of test to other test types in the area of spelling, and also the problems the new test has in common with other types of tests.

The author maintains that results of studies of spelling errors cannot only be used in the construction of future tests, but could also be used in the teaching of Danish.

The following list of the meaning of the technical terms used may be of help in the study of the appendices.